PROJECT NUMBER: 2706
PROJECT TITLE : New Expanded Tobacco
PROJECT LEADER : T. M. Howell
PERIOD COVERED : February, 1991

I. EXPANDED TOBACCO

A. Objective: Determine if the CV of expanded filler can be improved and/or if post expansion collapse can be reduced by pretreating DIET feed with approved additives. Determine if these same additives improve the CV of Blend components.

B. Results: The CV of Burley filler was increased by the addition of either calcium acetate or calcium hydroxide and the increase was to some extent greater than that observed for bright filler. A 1.3 cc/gm CV increase was attained on burley filler by adding 5% calcium hydroxide at 30% OV and bulking for 24 hours. A 0.5 cc/gm CV increase resulted with the addition of 3% calcium acetate. Applying 10% glucose to the burley prior to adding 3% calcium acetate did not yield any further improvement.

Results for the expansion of burley containing calcium acetate or calcium hydroxide were not consistent with those observed for the unexpanded filler. There was no improvement in CV in either case. The addition of 10% glucose to burley increased the equilibrated OV of the expanded filler yielding a CV of 10.2 cc/g. Combining calcium acetate with the glucose increased the CV to 11.1 cc/g at the higher equilibrated OV.

Applications of 0.5% calcium acetate and 0.4% calcium hydroxide to bright tobacco did not affect the stiffening of the filler.

C. Conclusions: The addition of calcium acetate or calcium hydroxide to burley filler yielded similar improvements in stiffness as seen for bright. The addition of glucose did not alter the results indicating that the mechanism for stiffening is unlikely to be by the reaction of calcium with the sugars present. The presence of glucose did appear to make a difference when the burley was expanded. Further testing is necessary in order to clarify this.

D. Plans: An analysis of all data collected to date is currently being made. Additional experiments are planned for optimizing stiffening conditions while minimizing additive amount, understanding the mechanism(s) for stiffening, and for evaluating other additive systems which may provide better subjectives.

II. EXPANDED TOBACCO

A. Objective: Evaluate humid air reordering as a means for reducing post expansion collapse during reordering.

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B. Results: Experiments have been initiated to determine rates of reordering and extent of collapse in CV and SV as a function of temperature, humidity, air velocity and bed depth.

C. Plans: Finish the initial experimental grid, analyze the data, and then recommend course for further testing.

III. EXPANDED TOBACCO

A. Objective: Determine the minimum temperature at which stiffening of expanded tobacco occurs and at what temperature the tobacco must be subjected to afterwards in order to prevent collapse upon cooling.

B. Results: DIET filler at 16% OVA which had been impregnated with liquid CO_2 in D Pilot Plant was used as stock to investigate the best thermal regimes for expansion and setting. Unequilibrated SV results showed significant improvement for samples exposed to thermal treatment on expansion when compared to a control expanded at ambient conditions. Expansion temperatures of 231° C for 7.0 seconds and setting temperatures of 134°C for 120 seconds have produced the highest SV measurements in these tests.

C. Conclusions: Attempts at decoupling expansion from setting have been unsuccessful to date with the available laboratory techniques. As past experiences have indicated, the degree of expansion is directly related to rate and amount of heat input during expansion. Setting temperature is also difficult to establish due to the influence of tobacco moisture on the plasticity of the tobacco shred. Efforts to determine the minimum thermal environment required for setting will have to factor in the effects of expansion rate and moisture content while using the current laboratory testing procedures.

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